DOCUMENT RESUME

ED 333 813 HE 024 661

AUTHOR	Massy, William
TITLE	Improving Productivity in Higher Education: Administration and Support Costs.
INSTITUTION	Forum for College Financing.
SPONS AGENCY	Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE	May 91
NOTE	13p.
AVAILABLE FROM	Stanford Forum for Higher Education Futures, Stanford Institute for Higher Education Research, 508 CERAS, Stanford University, Stanford, CA 94305-3084.
PUB TYPE	Collected Works - Serials (022)
JOURNAL CIT	Capital Ideas; v6 n1 May-Jun 1991
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Administrator Evaluation; *College Administration; Costs; *Evaluation Methods; *Higher Education; Improvement Programs; *Institutional Evaluation; Office Automation; *Productivity; Resource Allocation

ABSTRACT

Among the many reasons why college and university costs are rising are factors internal to the institutions which hold down productivity. Most efforts to improve productivity usually fail because they do not introduce new energy or information from the outside. In order to improve productivity, formal, non-quantitative evaluation should include a process-by-function matrix where function refers to activities generally associated with an organizational unit. A next step includes process flowcharts for the processes in the previous matrix (e.g., information on the order in which activities are typically or necessarily performed). Next the process must diagnose by examining the importance, reliability, and redundancy of each element of each flowchart. Once satisfied that only essential tasks are being performed, the next step is to determine whether they can be performed more efficiently using automation and information technology. Finally, the effort must optimize staff allocations by substituting less expert and hence less costly people for those with higher levels of expertise. However, despite the understanding derived from evaluation, direct management intervention is required to remove the impediments and unleash the forces that will enhance productivity and allow more resources to flow to academic operations. (JB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED333813

CAPITAL IDEAS

a publication of the
FORUM FOR COLLEGE FINANCING

Vol. 6, No.1
May/June, 1991

Improving Productivity in Higher Education: Administration and Support Costs

Productivity and cost management have reached center stage in higher education. Few issues receive more attention from trustees and senior administrators; few issues are as likely to dominate the debate on higher education strategy and planning during the next decade.

Cost and productivity have come a long way. Only recently, they were largely shunned or ignored on most campuses. Today, that has changed. Triggered initially by public outrage over rapidly rising tuition and by government concern over research and other costs, close scrutiny of productivity and cost is now also driven by the need to curb or avoid annual deficits. Managing costs is the most effective way for many institutions to balance the books today and maintain financial equilibrium in the future.

This issue of ***Capital Ideas*** *presents some strategies for improving administrative and support services productivity. It is authored by Dr. William Massy of Stanford University based upon his experiences at Stanford. The next issue of* ***Capital Ideas*** *will focus on improving academic productivity.*

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Forum for College Financing
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

A Project of the National Center for Postsecondary Governance and Finance

HE 024 661

Overview

There are many reasons why college and university costs are rising. These include: labor intensiveness, the expanding knowledge base, faculty salary growth, new technology, utility cost rises, and federal reporting requirements. These *external* factors are all important cost-drivers. *Internal* factors, like the process by which institutions measure productivity and allocate resources, also contribute to the problem. For example, why are new programs, functions and services usually add-ons to budgets rather than replacements for existing activities? Why do investments in new facilities add to rather than reduce costs? Why is there so much emphasis on quality and so little on efficiency? Why aren't quality and cost-effectiveness linked? Why do support service departments suffer the same productivity *malaise* as academic departments? Why don't institutional leaders put more stress on productivity?

Higher education's *cost disease* and *growth force* are two reasons why costs keep rising in *real* terms. The cost disease escalates expenses faster than inflation, even when there is no change in the number of students, faculty, and staff. Most operating costs are wage-driven, and labor market competition links school's real salary increases to the rate of economywide productivity improvement. This theory is borne out by the behavior of the higher education price index (HEPI) in relation to the CPI. The former rose at an annual rate of 6.4 percent for the period 1961 to 1986, while the latter rose by 5.3 percent, a difference of 1.1 percent. The differential was 1.0 percent for the decade of the 1960's, 1.0 percent for the 1970's as

BEST COPY AVAILABLE

The cost disease theory expostulates that as long as a school's student-faculty ratio stays constant, its unit costs will tend to grow in real terms.

Administration and student services are the fastest growing cost categories for most institutions.

higher education let salaries lag to cope with the oil crisis, and 2.3 percent in the 1980's as salaries finally caught up. The *cost disease* theory expostulates that as long as a school's student-faculty ratio stays constant, its unit costs will tend to grow in real terms.

The *growth force* drives up budgets even faster than *cost-rise* because of program additions and reluctance to reallocate money from old programs. The need for new academic programs springs from the dynamism of knowledge development and the creativity of college and university faculty and students. An institution that fails to innovate will soon fall behind, an outcome that university officers seek to avoid. Add-ons are also the rule in administration and support services. The cost of meeting a new government regulation or supplying a newly-demanded service is usually layered on top of existing costs.

These certainly are not the only reasons why unit costs rise. Others include the growth of regulation, high utility costs, and the accretion of *organizational slack*. Whatever the combination of causes, current fund expenditures per FTE student in all higher education institutions grew at an annual rate of 1.5 percent over the HEPI between 1975-76 and 1985-86. (The figures for public and private institutions were 1.2 percent and 1.6 percent, respectively.)

Diagnosing Productivity Problems

Administration and support costs represent about 30 percent of educational and general expenditures for public institutions and more than 40 percent for private institutions. Most *indirect* costs, other than for libraries, are growing faster than *direct* costs (see Figure 1). Administration and student services are the fastest growing cost categories for most institutions. Since they account for a quarter of all educational and general expenditures, their rate of growth has a significant impact on an institution's overall cost structure. Operating and maintenance expenses, representing about 10% of costs and growing at about 10% a year, also warrant scrutiny: they may be artificially depressed, creating deferred maintenance — and costs. How does an institution improve its understanding of cost behavior? *Growthrate* and *marginal cost* analysis are a good place to start.

Growthrate analysis The first step in assessing administrative and support costs is to systematically scan the pattern of cost increases during the last three to five years. The analysis can proceed as follows:

(1) Develop a *tree structure* for the administration and support services organization from the chart of accounts;

Figure 1: Growthrates of Key Expense Categories: Public and Private Higher Education 1975-6 to 1985-6

	Public	Private
Indirect:		
Administration	5.0%	7.6%
Student Services	4.9%	8.3%
Libraries	0.4%	1.6%
O & M	3.4%	5.0%
Direct:		
Instruction	2.7%	4.5%
Research	5.1%	3.5%
Public Service	3.6%	7.0%

BEST COPY AVAILABLE

(2) Extract data for two or more benchmark years based on this structure;

(3) Calculate the annualized growth for each organizational unit in the tree; and

(4) Focus attention on the high-growth units.

If no assignable cause for the high growth can be found, the unit is a prime candidate for cost reduction. Since it is hard to determine the most meaningful level of aggregation in advance, it is best to start at a fairly low level in the tree and then roll up the results until the level of detail becomes manageable.

Recently, this type of analysis was performed at a Midwestern research university. The tasks were easy and the results were enlightening. The operating units were ranked on the basis of growthrate in expenses, and attention was focused on the *outliers* — especially in the "up" direction. Some of the extremes turned out, on closer investigation, to be due to readily assignable causes, such as reorganization or a highlevel management decision to add to service levels. In other cases, the growth seemed more to be due to steady accretion. This led to the question, "Why?"

Marginal Cost Analysis Sometimes indirect costs are driven by changes in the scale of direct activities, such as instruction and research. The slope of this relationship is the *marginal* or incremental cost of the indirect activity with respect to the direct one. The concept of marginal costs is pretty straight forward-- the increase in total cost resulting from raising the rate of production by one unit. However, it is rarely applied to colleges and universities. There are a number of approaches available including:

(1) The regression method;

(2) The fixed- and variable-cost method; and

(3) The incremental-cost method.

Briefly, the first is a statistical procedure usually based on time-series data. The second decomposes each element of expense into fixed and variable components based on a detailed understanding of the processes involved. The third attempts to identify and quantify just those components of cost that vary with a given external variable. Information about marginal costs may help to interpret the results of the growthrate analysis. It may be possible, for instance, to normalize some of the growthrates for changes in the *costdriving activities.*

If no assignable cause for the high growth can be found, the unit is a prime candidate for cost reduction.

There may be multiple cost-driving variables, in which case the regression approach may be required to separate their individual effects. It may be advisable to stick with a single cost-driver variable for each organizational unit at the start. (You can usually disaggregate another level or two and find a unit with one main driver.) There is, of course, no harm in having different cost-drivers for different organizational units — this will be required if the analysis is to be comprehensive. At Stanford University, the preliminary specifications for an institution-wide marginal cost study included the following cost-drivers:

- *Employee headcount:* used in Controller's Office (payroll) and Personnel Services
- *Accounting transactions:* used in Controller's Office (general accounting)
- *Number of separate funds:* used in the Treasurer's Office
- *Building square footage:* used in operations and maintenance, security, health and safety

Sometimes indirect costs are driven by changes in the scale of direct activities, such as instruction and research.

There is no magic to these definitions. What is important is to start somewhere and build an internally consistent set of measures that can normalize expense growthrates. Although the model can be refined later, even rough marginal cost measures may be helpful.

What about growthrate outliers that cannot be explained by cost-drivers? A two-phase analysis may be informative. First, try to identify some other assignable cause

Many institutions are not only slow to adopt productivity-enhancing innovations, but actually tend to self-destruct *with respect to productivity.*

The beneficial aspects of slack are even more important in higher education than in industry, and they are most important in research universities where innovation must be a way of life.

that is acceptable from the standpoint of productivity — for example, new regulations. Be careful, though, not to accept rationalizations. Much of what is explained away as *increased complexity* turns out to be bureaucratic accretion, the nemesis of productivity. The rule should be to take a hard look at all outliers, and some units that are not outliers but which should be considered as such because of known external forces that may be expected to reduce their workload. The next step is to examine the unit for the kind of productivity-degrading factors discussed below.

Why Efforts to Improve Productivity Usually Fail

Many institutions are not only slow to adopt productivity-enhancing innovations, but actually tend to *self-destruct* with respect to productivity. The self-destructive forces can be compared to the thermodynamic concept of entropy. Any closed system will *run down* because its energy will eventually distribute itself evenly in the state of lowest potential. The only way to counter this tendency is to introduce new energy or information from the outside — that is, to open the system. How can higher education leaders *introduce energy and information* and avoid the *running down* of productivity. First, we must understand the three major self-destructive forces.

Build-up of organizational slack The build-up of slack is the first degrading force. Slack can stem from simple inattention to efficiency — in which case *fat* is an apt description. Slack also can arise when employees are prevented from performing effectively or when their personal goals are inappropriately substituted for those of the organization. The latter phenomenon, known more properly as *resource diversion*, is based on the view that people will pursue their own interest at the expense of the organization's. Substitution of personal for organizational goals can take the form of loafing, appropriating the organization's resources for personal use, or becoming obsessed with one's own rights and privileges.

Why Productivity Improvement Fails

- Build-up of of organizational slack
- Accretion of unnecessary tasks
- Function lust

Slack is not always bad. Too strong an emphasis on efficiency can demotivate employees and possibly stunt innovation, as indicated in this quotation from James March:

> "Under good conditions, slack generates ideas, many of them too risky for immediate adoption. When conditions change, such ideas are available as potential solutions to new problems. An organization is able to meet brief periods of decline by drawing on discoveries generated, but overlooked, during better times. A prolonged period of adversity, or of exceptional efficiency in avoiding slack depletes the reservoir and leaves the organization vulnerable." (Review of Higher Education, V6, 1982.)

The beneficial aspects of slack are even more important in higher education than in industry, and they are most important in research universities where innovation must be a way of life. This is why faculty sometimes question the overzealous pursuit of efficiency in academic departments. Their concerns are reinforced by the fact that what might seem like slack to an outsider is actually the contemplation necessary to produce new discoveries. On the administrative and support side of colleges and universities, however, the value of slack probably is about the same as for business and government — some slack is a good investment for the future but too much is an unacceptable drag on current operations.

Slack tends to build up in good times and then be squeezed out when times are bad. J. Paul Austin, chairman of the United States Steel Corporation during the 1950s, once said that U.S. Steel was, "like a big bear — building up fat during economic booms and then hibernating, maintaining itself by shedding fat, during recessions." The cyclical process seems inevitable, but if it is not managed, the slack may build to dysfunctional levels during good times

and the eventual squeezing-out may be incomplete. Institutions may choose to restructure and improve during the course of each cycle rather than simply allowing history to repeat itself.

Accretion of unnecessary tasks. Everyone can be busy performing his or her tasks with energy and intelligence, and yet the organization as a whole may lack productivity. The key is deciding *what* tasks are performed. More precisely, the question is: do the tasks taken separately and as an ensemble contribute optimally to the long-run purposes of the whole institution. Productivity is a measure of effectiveness. It reflects an assessment of the usefulness of what is being done, as well as the ratio of outputs to inputs. Effectiveness is not the same as efficiency, which is based on a narrower measure of what resources are required to accomplish a particular task-- without regard to the task's value.

There are many reasons for the accretion of unnecessary tasks. Employees or managers may lack competence and thus create unnecessary work for others — as when a personnel department must "clean up an employee relations mess" left by an overbearing supervisor. If not corrected decisively, certain types of incompetence can become the organizational norm. An office or department may also create unnecessary tasks by suboptimizing, without regard to the problems this creates elsewhere in the organization. Suboptimization can result in redundancy of effort — as when two departments teach the same course, each to half the optimal number of students.

Instituting procedures to correct new problems without going back periodically and asking how the set of procedures may be refined is another common cause of task accretion. There are many possibilities for pruning. Perhaps the incidence of the problem has declined over time. Maybe a later procedure developed for a different purpose covers much of the same ground. Possibly the combined effect of multiple procedures is so disruptive that their cost effectiveness is destroyed. And, perhaps, a new management or governing body is prepared to take greater risks in order to be more productive. Whatever the situation, the continual layering-on of new procedures to address new problems will in time degrade productivity. Conscious decisions and much energy are required to reverse this trend and eliminate layers lest their cumulative effect stifle organizational effectiveness at an ever-increasing rate.

Function lust. This is the third major destructive force. Controllers think controlling is important and tend to want to do more of it. The same is true for auditors, planners, builders, landscape architects, lawyers, and even minute-takers in the myriad of meetings that characterize campus life. Student services professionals, librarians, and all can make a plausible case about why an institution would benefit from producing more of their specialty. While the term *function lust* is pejorative, the motives of those who perpetuate the notion, at least in their own eyes, are pure. All these functions are important. The problem is that specialists are not necessarily in the best position to gauge their importance in relation to other institutional needs. They can do a good job of assessing absolute importance but are less successful in determining and negotiating trade-offs with other functions.

The desire to grow in one's job and get promoted also contributes to administrative task accretion. Job classification systems that offer advancement on the basis of budget size or the number of people supervised are particularly prone to this malady. Institutions whose managers permit *turf wars* also invite accretion because the incentives are to "staff up" in order to win the competition with other units rather than to cooperate with them. A certain amount of competition can be healthy, but too much is wasteful.

Escalating spirals of administrative interactions are another prime cause of task accretion. For example, a good person is hired to perform a certain task. This task results in the discovery of new problems, creating the need to perform additional tasks. Others in the organization are drawn in, since they must respond to or defend against the new initiatives. Problems of coordination increase and more time is

The question is: do the tasks taken separately and as an ensemble contribute optimally to the long-run purposes of the whole institution.

The continual layering-on of new procedures to address new problems will in time degrade productivity.

"The supply of administrators creates its own demand."

spent in meetings. Soon additional people must be hired to keep up with the increased workload. They, in turn, find new problems and create work for others — thus perpetuating the spiral. One observer describes this phenomenon as follows: "the supply of administrators creates its own demand." Other writers make the same point — government bureaucracies grow inevitably and inexorably as they respond to new sets of problems. These problems beget new organizations or increase the number of layers in existing organizations. This is the reason why regulated industries end up with so many layers of management.

How to Improve Productivity

While data on expenditure or staff growth rates for an institution's units can identify areas where productivity is suspect, these quantitative measures cannot provide information on *why*. Informal managerial evaluation is the method of choice for diagnosing problems. There is no substitute for *management by walking around*, especially in territory where there is reason to expect subtly hidden difficulties. Unfortunately, though, even the most perceptive managers may well miss systemic issues — those that involve more than one function or unit — if they rely solely on intuition. A more formal approach can be more efficient, especially if the organization is embarking on a major productivity enhancement effort.

The Process-By-Function Matrix Certain key administration and support operations are common to all colleges and universities of a given size and type, regardless of how they are organized. These operations can be displayed in a *process by function matrix* (see figure 2), where *function* refers to activities generally

Figure 2: A Hypothetical Process-By-Function Matrix

	Process							
	Human Resources		Buying: general	Buying: equipment		Submitting research proposals	Procurement contracts	
Function	hiring people	paying people		government projects	university funds		government projects	university funds
Academic or operating department	•	•	•	•	•	•	•	•
Cognizant school dean or vice president	•	•	•	•	•	•	•	•
President or provost	•	•			•			•
Dean of research				•		•	•	
Affirmative action officer	•	•						
Personnel Office								
Employment	•							
Compensation		•						
Employee relations		•						
Controller's office								
Payment screening	•		•	•	•		•	•
Accounts payable			•	•	•		•	•
Payroll	•	•						
General accounting	•	•	•	•	•		•	•
Sponsored projects office						•		
Legal Office							•	•
Facilities Office							•	•
Procurement department			•	•	•			

BEST COPY AVAILABLE

associated with an organizational unit. This is an important first step in a productivity improving process.

The important processes of hiring and paying people are depicted in the first two columns of the matrix. Each process is initiated by an academic or non-academic operating department. The action must then be approved by the cognizant school dean or, in the case of non-academic units, the vice president or his or her delegate. Actions on high-level positions must be approved by the President or Provost. In many cases the Affirmative Action Officer must approve as well. The Personnel Department will review and render an opinion sometime during the process. Though Personnel may not have the last word, their views are taken into account by the aforementioned decision-makers. The payment screening section of the Controller's Office may be asked to verify that funds are available and that the hiring or salary is consistent with the project budget and other contractual requirements if this is a sponsored agreement. Of course, the Payroll Department and the General Accounting Department get involved in processing the transaction when it finally comes to pass.

Often a process will *loop back* to involve a given function more than once. Consider the process of purchasing, for example. This is done many thousands of times annually and while it would seem to be a simple task, it really is very complicated. The transaction usually originates in an academic or operating department. The typical pattern is for a purchase order to be checked for funds availability by the payment screening group, and sent to Procurement for vendor selection and, if applicable, negotiation of price and terms. Procurement writes a purchase order and notifies the vendor, the originating department, and Accounts Payable. The order is shipped directly to the originating department, so they are responsible for matching the purchase order to the packing slip and notifying Procurement and Accounts Payable that the desired goods have been received and are satisfactory. In the meantime, the vendor sends a bill to Accounts Payable, which holds it until it receives the receiving notice. The bill is paid, perhaps after a lag to optimize the financial float, and then the transaction is entered into the general ledger. It then appears on the originating department's budget and expenditure statement. No wonder faculty complain about turnaround and departmental administrators are driven to their wit's end trying to keep track of outstanding expenditure commitments. Similar descriptions could be given for the other processes in the matrix.

Process Flowcharts. The next step is to develop flowcharts for the processes shown in the matrix. Flowcharts add information on the order in which activities are typically or necessarily performed (the charts should indicate which). Useful insights can be added by showing the range of delay times and the number of man-hours required to transit each step. The approach should be pragmatic; a level of detail that illuminates the process is preferred to one that obscures it in a maze of unimportant detail. These are management displays, not engineering or computer program specifications. Their purpose is strategic. It provides essential information on the order in which the gross tasks that make up a process are or should be performed, not on *how* each task should be performed. Each flowchart should take up no more than a single page, so that the entire package will fit comfortably into a notebook.

Importance, Reliability, and Redundancy. With flowcharting accomplished, we are ready to turn to diagnosis, which begins with the analysis of *importance, reliability,* and *redundancy.* (This step has been dubbed "IRR," in part, because it provides an "internal rate of return".) The IRR tests are applied to each element of each flowchart.

The process as a whole already has passed an importance test because it was included in the process-by-function matrix. But this is not necessarily the case for its individual elements. Therefore, the first point of scrutiny is whether the element is in fact *important* enough to survive. Tasks that have "accreted" into the system by one of the mechanisms described earlier will not automatically pass a rigorous importance test.

Useful insights can be added by showing the range of delay times and the number of man-hours required to transit each step.

The first point of scrutiny is whether the element is in fact important enough to survive.

One of the impediments to purging tasks is the counter-argument that to do so would *degrade the quality of the process.* Quality is a loaded expression in colleges and universities, but one should not allow this assertion to trump the question of importance — even if the assertion is demonstrably true. The answer lies in recognizing that there are two kinds of quality, *design quality* and *implementation quality:*

Quality is a loaded expression in colleges and universities, but one should not allow this assertion to trump the question of importance.

> ***Design quality*** is the quality designed into the product or service. A BMW has more of this kind of quality than a Ford and, of course, it is more expensive. For some purposes and purses the BMW represents the best price-quality trade-off; for others, the Ford wins out. It is possible even to construct examples where the Ford is better in absolute terms — regardless of price. Driving in high crime areas or where parts and specially trained mechanics are hard to find are two cases in point. The key idea is that more design quality is not always better; it needs to be calibrated to the task or situation at hand.
>
> ***Implementation quality*** deals with how well the product or service meets its specifications. If the product is to be a Ford, let it be a well-built Ford. It should be the same whether assembled Monday morning or Wednesday afternoon — no lemons allowed. American industry has learned the hard way that implementation quality nearly always should be maximized. "Do it right the first time" is an important principle both for customer satisfaction and for productivity. Everyone can take pride in producing the best possible implementation quality, but not everyone need aspire to build (or drive) BWMs.

Implementation quality is obtained by hiring good people, training them well, and providing good leadership and supervision.

Allowing higher education's reverence for quality to enhance implementation quality is positive. Allowing this reverence to mandate unneeded levels of design quality for administration and support services is not. Therefore, one should go through each process flowchart and ask whether the tasks are specified at the minimum acceptable level of design quality. We should insist on high implementation quality, but academic program need should rule out unnecessarily expensive work specifications in the administrative and support areas. Implementation quality, on the other hand, rarely costs significantly more. Indeed, institutions are probably paying for this kind of quality anyway. Implementation quality is obtained by hiring good people, training them well, and providing good leadership and supervision.

Reliability is the next diagnostic factor. It is related to design quality and implementation quality, but is worthy of separate consideration for two reasons. First, certain designs will be unreliable even with high implementation quality; these should be avoided if the penalty for failure is high. Second, issues of reliability tend to be systemic rather than oriented toward individual process elements.

The technique of Total Quality Cost ("TQC") is being used by many companies as a way to assess reliability. The objective is to understand what is being spent on maintaining reliability (i.e., preventing failures) and what is being spent on correcting or insuring against failures. Only by looking carefully at both sides of the equation can an optimal balance be reached. In one case, some 80 percent of cost was due to failure, suggesting that the best trade-off might be to spend more on prevention. The trade-off can go the other way, too. An occasional accounting error that can be fixed later is not as consequential as having a part not work as designed or, worse yet, fail in use. Health and safety, systemic financial control weaknesses, and personnel policy are probably the most worrisome risks — the first for obvious reasons, the second because disal-

Five Steps to Improve Productivity

- Process-by-function matrix
- Process flowcharts
- Analysis of importance, reliability, and redundancy
- Application of technology
- Leverage

lowances and defalcations can be very costly, and the last because of the possibility of class-action lawsuits. The total cost of quality should be assessed for each of the processes included in the matrix.

Redundancy is a clear waste of resources unless it is needed for reliability. Redundancy tends to build up as a by-product of administrative task accretion, and it takes conscious effort and energy to identify and eliminate it. This is basically a matter of common sense; go through the process flowchart and simply ask whether each task is also done somewhere else. If the answer is "yes," then question whether the task is needed to contain risk (i.e., for reliability) and how much the risk would be increased if it were eliminated. Often the same risks are mitigated several times in complex systems. One can be more vigorous in rooting out redundancies in processes where the risks of failure are in terms of individual transactions rather than systemic operations.

Finally, it is important to determine whether each process should be *centralized* or *decentralized*. Some, requiring precise procedures and quality control, must be centralized in order to enhance performance and contain risks. Others are better left to the creativity and initiative of those closer to the action. More situations are likely to fall into the latter category than are readily apparent, though each instance requires careful analysis. But one rule generally applies: decide whether a process must be centralized or whether it can be decentralized, and then insist that things be done that way. Do not allow a decentralized process to drift toward centralization because of task accretion by staff groups or second-guessing by upper-level managers. Such behavior can be a heavy drag on productivity.

Technology. Once satisfied that only essential tasks are being performed, the next step is to determine whether they can be performed more efficiently. Substituting capital for labor is the classical approach for improving productivity. The *second industrial revolution*— represented by information technology — provides unusual opportunities. Volumes have been written about the advantages of office automation; still a few caveats are in order:

- Don't try to automate work processes exactly as they are being done by conventional means. The result will nearly always be a more expensive and less satisfactory product than can be obtained by changing work flows to fit the new opportunities — this is true especially if packaged software is available to do some or all of the job.

- Strive to input data only once, as close to its original source as possible. Minimize paper flows and the need for multiple inputs and files. These increase original costs and create subsequent costs when resynchronization is required.

- Don't try to get the process exactly right the first time. Modern software development tools permit systems to evolve as people gain experience with them. Often it is best to build a working prototype that will mature during the project rather than to lock in a complex set of specifications before coding begins. This avoids the endless arguments about *once-and-for-all* decisions that are so familiar in traditional development environments.

Substituting capital for labor is the classical approach for improving productivity.

Over the long run, automation can cure the cost disease by substituting a resource whose unit costs are declining in real terms for one whose unit costs are constantly increasing. Sometimes, the up-front investments are hard to justify, and it certainly is necessary to be discriminating. Still, institutions that are not making information technology a leading investment are likely to be left behind in terms of productivity.

Automation can cure the cost disease by substituting a resource whose unit costs are declining in real terms for one whose unit costs are constantly increasing.

Optimizing staff allocations. Like law, accounting, and consulting firms, colleges and universities rely on the services of highly trained professionals— on the support staff as well as the faculty.

Productivity improvement in professional service firms is obtained mainly by substituting less expert and hence less costly people for those with higher levels of ex-

Direct management intervention is required to remove the impediments and unleash the forces that will enhance productivity.

The add-on spiral must be broken if the costs of higher education are ever to be contained.

pertise. Senior partners leverage their time with that of junior partners, associates, and research assistants, and so on down the pyramid. The cardinal rule is, "always use the least-expert resource that can do the job." Many colleges and universities spend substantial sums on support staff who directly leverage faculty time. Additional sums are spent for lower-level staff who support higher-level people all through the administrative and support areas.

Time leveraging in colleges and universities is a double-edged sword. The advantages are similar to those in professional firms. However, more leverage is not desirable unless it leads to an economy elsewhere. Under what circumstances do such substitutions increase productivity? The answer is easy when we are talking about professional services: substitution is productive if it increases the partners' income. For colleges and universities, the problem is much harder because there is no profit measure and, of course, most administrative and support service outputs are intangible.

A Caveat: Management Intervention is Necessary

Understanding the factors that inhibit productivity in administrative and support services is not enough. Direct management intervention is required to remove the impediments and unleash the forces that will enhance productivity and allow more resources to flow to academic operations.

Many of the diagnostic tools discussed in the previous section contain implicit blueprints for management intervention. The solutions for certain problems are obvious once their existence is understood. Unfortunately, a straightforward problem-by- problem attack on productivity often fails to achieve the expected results. The complex interactions among the productivity-inhibiting factors and the natural resistance to change require a carefully reasoned and integrated management intervention strategy.

The growth of medical costs could not be contained until the cost-plus rules of Medicare and Medicaid were amended to establish limits on how much the government would pay for a given procedure or length of hospital stay. The airlines, the railroads, and the phone companies could not strip away unneeded layers of management and cultural impediments to productivity until deregulation converted cost-plus to competitive pricing. U.S. industry as a whole could not streamline itself until foreign competition made productivity a virtual necessity. The add-on spiral must be broken if the costs of higher education are ever to be contained. The continued layering of program on program, cost on cost, will sooner or later cause higher education critics to shift from rhetoric to action. It is far better to solve this problem within the academy than have solutions imposed from outside. The experience of the medical profession, which a decade ago was seen singularly unresponsive to cost containment, supports this thesis.

To arrest the cost-plus spiral, institutions must:

- End cost-plus pricing and place strict limits on spending growth which, in effect, simulates the discipline of the marketplace.
- Establish planning and resource allocation processes and incentives that promote innovation and stimulate resource reallocation from areas of lower potential and productivity to higher ones. This means "closing the loop" by providing feedback mechanisms to aid productivity improvement.

In other words, the message is, "Say no, but don't just say no." Institutions must

In the next issue, the second in a two-part series on productivity in higher education: Improving Academic Productivity

BEST COPY AVAILABLE

simultaneously enforce spending constraints and make certain that governance and management processes can generate productivity improvement to fund needed innovation.

The lesson from industry is that while resource constraints are a necessary condition for unleashing productivity improvement and innovation, they are not sufficient. Financial pressure, by itself, can crush initiative or create conflict over shares of a fixed or shrinking pie. The challenge is to mitigate these effects and turn the financial pressure into a driving force instead of a crushing burden.

We're moving and changing our name. Our new name is
The Stanford Forum for Higher Education Futures.
Our new address is:

The Stanford Forum for Higher Education Futures
Stanford Institute for Higher Education Research
508 CERAS
Stanford University
Stanford, CA 94305-3084
(415) 723-7724

CAPITAL IDEAS

a publication of the
Forum for College Financing
(212) 678-3293

Directors:
Richard E. Anderson
Joel W. Meyerson

Associate Director:
Barry Sugarman

Funding and Affiliation:
Funding for this project and the newsletter is provided by the United States Department of Education's Office of Educational Research and Improvement. The Forum for College Financing is a project of the National Center for Postsecondary Governance and Finance. Executive offices are located at the University of Maryland, College Park.

The contents of this newsletter were developed under a grant from the Department of Education. However, the contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government.

Copyright © 1991. Forum for College Financing.

BEST COPY AVAILABLE

CAPITAL IDEAS

Teachers College, Columbia University
Box 38/ 525 West 120th Street
New York, NY 10027